

Chapter 2 • Lesson 8

Energy Resources and Their Environmental Impact

Objectives: A.P.1; A.P.2.2

Key Words

• environment • nonrenewable energy resource • renewable energy resource • fossil fuel
• pollution • solar energy • photovoltaic cell • solar reflector • solar battery • wind energy
• hydropower • biomass • geothermal energy



Getting the Idea

Humans use large amounts of energy to power cars, heat homes, and produce electricity. That energy comes from resources found in nature. Humans' choices and use of energy resources affect the **environment**, or surroundings, of all living things.

Types of Energy Resources

Energy resources can be classified as either nonrenewable or renewable.

A **nonrenewable energy resource** is used much faster than it can be replaced.

A **renewable energy resource** either can be replaced as it is used or cannot be used up. People must consider the advantages and disadvantages of each energy resource when deciding which types to use.

Nonrenewable Energy Resources

Most of the energy used in the United States comes from fossil fuels. A **fossil fuel** is an energy resource that formed over millions of years from the decayed remains of ancient plants and animals.

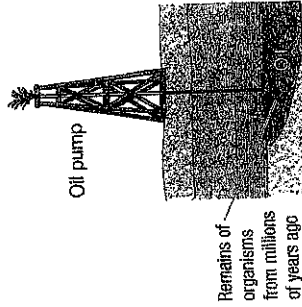
Coal is a solid fossil fuel that formed from decayed plants that lived millions of years ago. Coal is burned in many power plants. The heat it releases is used to boil water. The steam that is produced expands and causes a turbine to spin. A turbine looks like a huge fan. The spinning turbine turns a generator, which changes mechanical energy to electrical energy. The electrical energy is distributed along wires that make up the power grid.

Petroleum is a liquid fossil fuel that is also known as crude oil. It formed from ancient sea organisms. The gasoline burned in car engines is made from oil. Propane, which is often burned to heat homes or cook food, is also made from oil.

Natural gas is a fossil fuel found along with petroleum. Natural gas is used in stoves, furnaces, water heaters, clothes dryers, and other appliances. Like coal, natural gas and petroleum can be burned in power plants to generate electrical energy.

The main advantage of fossil fuels is that they produce large amounts of energy when they are burned. However, fossil fuel use can cause **pollution**, the release of unwanted materials into the environment. Burning fossil fuels causes air pollution. Coal mining can damage land and pollute nearby water supplies.

Oil is obtained by drilling deep into Earth's crust. Drilling for oil may disturb habitats—the places where plants and animals live. Sometimes oil is spilled at a drilling site or from a ship carrying oil. Such accidents can severely damage habitats.



Burning fossil fuels releases carbon dioxide. Scientists have observed that carbon dioxide in the atmosphere has increased during the last few hundred years. This is about the same amount of time that people have been building and using machines powered by fossil fuels. Many scientists believe that extra carbon dioxide from burning fossil fuels is causing or adding to global warming and climate change. **Global warming** is a trend of rising average temperatures around the world.

Another source of electricity used in the United States is nuclear energy. Recall that nuclear energy is energy stored in the nucleus of an atom. Nuclear power plants produce electrical energy by breaking apart atoms to release this stored energy. Most nuclear power plants use the element uranium, a nonrenewable resource, as fuel.

An advantage of using nuclear energy is that it does not cause air pollution. A disadvantage is the possibility of an accident that could release radioactive materials into the environment. Radiation from such materials can be very harmful to humans and other living things. Nuclear power plants also produce radioactive wastes. These must be stored safely for a very long time.

Renewable Energy Resources

Humans have used energy from wind and moving water for thousands of years. Today, these resources are used to produce electricity. Other renewable resources are also used as sources of energy.

Energy Resources reading questions

1. Write the definition of renewable energy resources
2. Write the definition of non-renewable energy resources
3. What is a fossil fuel and what energy source use them
4. Tell one pro and one con about using fossil fuels
5. What greenhouse gas is produced from burning fossil fuels?
6. How has fossil fuels affected global warming?
7. Try to think of two examples of renewable energy resources